Braz J Otorhinolaryngol. 2016;82(1):76–81

Brazilian Journal of
OTORHINOLARYNGOLOGY
www.bjorl.org

ORIGINAL ARTICLE

# Intensive care unit: results of the Newborn Hearing Screening☆,☆☆

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Received 6 July 2014; accepted 7 January 2015
Available online 29 October 2015

**KEYWORDS**
Hearing loss;
Newborn;
Newborn screening;
Intensive care units

**Abstract**
*Introduction:* Procedures for extending the life of newborns are closely related to potential causes of hearing loss, justifying the identification and understanding of risk factors for this deficiency.
*Objective:* To characterize the population, analyze the frequency of risk factors for hearing loss, and assess the audiological status of infants attended in a Newborn Hearing Screening program (NHS).
*Methods:* This was a retrospective study that analyzed medical records of 140 patients from a neonatal intensive care unit, identifying the frequency of risk factors for hearing loss and audiological status, utilizing transient otoacoustic emissions and brainstem auditory evoked potential (BAEP).
*Results:* Prematurity was present in 78.87% of cases; 45% of the infants were underweight and 73% received ototoxic medication. Audiologically, 11.42% failed the NHS, and 5% of cases failed retest; of these, one had results compatible with hearing loss on BAEP.
*Conclusion:* A higher rate of low birth weight, and prematurity was observed in infants who underwent screening and had an audiological diagnosis by the third month of life. Only one newborn presented a change in audiological status. The authors emphasize the importance of auditory monitoring for all infants, considering this as a high-risk sample for hearing loss.


☆ Please cite this article as: Rechia IC, Liberalesso KP, Angst OVM, Mahl FD, Garcia MV, Biaggio EPV. Intensive care unit: results of the Newborn Hearing Screening. Braz J Otorhinolaryngol. 2016;82:76–81.
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http://dx.doi.org/10.1016/j.bjorl.2015.06.004

**PALAVRAS-CHAVE**
Perda auditiva;
Recém-nascido;
Triagem neonatal;
Unidades de Terapia Intensiva

**Unidade de Terapia Intensiva: resultados da Triagem Auditiva Neonatal**

**Resumo**
*Introdução:* Os procedimentos para prolongamento da vida dos neonatos estão intimamente relacionados com possíveis causas de deficiência auditiva, justificando-se a identificação e o conhecimento dos indicadores de risco para tal deficiência.
*Objetivo:* Caracterizar a população, analisar a frequência dos indicadores de risco para a deficiência auditiva e verificar o status audiológico de bebês atendidos num programa de Triagem Auditiva Neonatal (TAN).
*Método:* Estudo do tipo retrospectivo. Foram analisados 140 prontuários da Unidade de Terapia Intensiva Neonatal, caracterizando a população estudada e a frequência dos indicadores de risco para deficiência auditiva e status audiológico, e considerando resultados das emissões otoacústicas transientes e a avaliação diagnóstica por meio do Potencial Evocado Auditivo de Tronco Encefálico (PEATE).
*Resultados:* Evidenciou-se prematuridade em 78,87% dos casos, 45% exibiam baixo peso e 73% estavam sendo medicados com agentes ototóxicos. Quanto ao status audiológico, 11,42% falharam na TAN. Houve falha no reteste em 5% dos casos e, destes, um neonato apresentou resultado compatível com deficiência auditiva no PEATE.
*Conclusão:* Houve maior porcentual de prematuros de baixo peso que realizaram a triagem e tiveram um diagnóstico audiológico até o 3° mês de vida. Apenas um neonato apresentou status audiológico alterado. Ressalta-se a importância de acompanhamento auditivo de todos os bebês, considerando esta amostra como de alto risco para deficiência auditiva.


## Introduction

The detection of speech sounds begins in intrauterine life, and is the first step in language acquisition, since it is known that hearing and language are interdependent but interrelated functions. Auditory experiences are of paramount importance, especially before the second year of life, as this is considered the critical period for language acquisition.[1–3] Thus, infants who are born with hearing impairment (HI), are deprived of contact with the world of sound. In this way, the right time for the detection/diagnosis of childhood HI is before the third month of life, and the intervention should begin before the sixth month.[1,4,5]

Studies show that the incidence of significant bilateral congenital HI in healthy neonates is about 1–3 infants/1000 births; conversely, in newborns referred from intensive care units the incidence increases to 2–4%.[5]

There are prenatal, perinatal, and postnatal complications that can cause HI in newborns; these are called risk factors associated with hearing loss (RFHL), namely: the concern of parents with respect to their child general development and the child's hearing, speech, or language development; familial history of permanent deafness; neonatal intensive care unit (NICU) stay >5 days; or occurrence of any associated condition, such as the use of ototoxic medication; congenital infections (rubella, cytomegalovirus, syphilis, herpes, and toxoplasmosis); craniofacial anomalies; genetic syndromes; neurodegenerative disorders; postnatal bacterial or viral infections; head trauma; and chemotherapy.[4]

Hospitalization in NICUs is a very frequent risk factor. Preterm infants are generally underweight, in need for lengthy mechanical ventilation, and may have hyperbilirubinemia at levels that require exchange transfusion, thus making a NICU stay imperative.[6]

The Newborn Hearing Screening (NHS) test is a safe and appropriate procedure for the early detection of HI in neonates and infants.[7] The current protocol designates as a NHS procedure the recording and analysis of transient-evoked otoacoustic emissions (TEOAE) for neonates without RFHL, and an automatic brainstem auditory evoked potential (aBAEP) study for those who have any RFHL.[4,5]

TEOAE recording is a relatively simple, quick, and objective method for detecting hearing changes of cochlear origin, specifically from the outer hair cells. This method does not quantify the HI, but detects the presence of a cochlear dysfunction.[8–10] BAEP, which is also an objective method, is obtained with surface electrodes that record neural activity generated by the cochlea, auditory nerve, and brainstem in response to auditory stimuli.[5,10]

The NHS outcome criterion is that of ''pass and fail''. The ''pass'' criterion expresses the non-likelihood of HI, and the ''fail'' criterion expresses the likelihood of HI and the need for a diagnostic evaluation. In case of failure, it is recommended to utilize the BAEP diagnostic procedure for an investigation of electrophysiological thresholds before hospital discharge and/or on the infant's return for retest. If the HI is not confirmed, these infants with RFHL should be followed-up, as they are at an increased risk of difficulties in hearing and in language skill development. If an alteration in BAEP responses is detected, the child will be referred